

Serial No.: 10/614,031

REMARKS

This response is being filed in response to the Office Action dated July 22, 2004. For the following reasons, this application should be considered in condition for allowance and the case passed to issue.

The allowance of claims 12-18 is gratefully acknowledged. The indication of allowability of claims 3-8 and 10-11 if rewritten in independent form to include all of the limitations of the base claims and any intervening claims is also gratefully acknowledged. However, in light of the arguments presented below, these claims have not been rewritten in independent form at this time.

Claims 1, 2 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Webb and further in view of Hung et al., (hereafter "Hung"). This rejection is hereby traversed and reconsideration and withdrawal thereof are respectfully requested. The following is a comparison of the present invention with the Webb and Hung references.

The present invention relates to a method of determining a work function of a metal and comprises the steps of forming a metal-on-silicon (MS) Schottky diode with a metal having a work function to be determined forming contacts of the MS Schottky diode. A capacitance-voltage curve of the MS Schottky diode is measured. The work function of the metal is determined based on the measured capacitance-voltage curve.

The present invention provides a simple and fast method of screening potential gate materials by determining their metal work function. A Schottky diode has been employed to measure the MOS-CV curve to thereby determine the metal work function of the metal materials. The Schottky diodes were formed by employing traditional

Serial No.: 10/614,031

lithography metal deposition and etch processing steps. The Schottky diode were metal-on-oxide-on-silicon diodes. The formation of the Schottky diodes by this traditional method is relatively expensive and time-consuming. This is a disadvantage when it is desirable to screen a large number of potential metal gate materials. Neither of the references, either alone or in combination, show or suggesting the invention as now claimed.

Webb, U.S. Patent No. 5,159,486, relates to an instrumentation apparatus and method utilizing a photoconductor as a light-modulated dielectric. The Examiner states that Webb discloses the claimed invention except for forming a metal-on-silicon (MS) Schottky. However, this failure to disclose an MS Schottky diode makes this reference completely irrelevant to the consideration of obviousness. Firstly, Webb does not provide any disclosure or suggestion of forming a MS Schottky diode with a metal-work function to be determined. Hence, Webb fails to completely disclose or suggest the first recited step of the claim. Instead, Webb describes the formation and use of a light-modulated photoconductor that is used for numerous applications, such as a dielectric between conductive plates to provide a light-modulated capacitor. This has nothing whatsoever to do with formation of an MS Schottky diode with a metal having a work function to be determined.

Secondly, Webb fails to disclose or suggest the measuring of a capacitance voltage curve of the MS Schottky diode. Such a step cannot be suggested since Webb fails to consider the formation of an MS Schottky diode. Therefore, Webb provides no showing or suggestion supporting the Examiner's assertions in this regard.

Serial No.: 10/614,031

Finally, Webb fails to show or suggest the determining of the work function of a metal of a MS Schottky diode, this metal having a work function to be determined. The portions of the patent cited by the Examiner describe the formation of a photocapacitor, and have nothing whatsoever to do with a MS Schottky diode.

Hung, U.S. Patent No. 5,608,287, is said by the Examiner to teach the three method steps (see the Office Action at page 3, paragraph 2). The Examiner references col. 4, lines 12-17 and line 35 through 47. However, these sections clearly show that the Hung reference does not disclose or suggest determination of the work function of a metal of an MS Schottky diode based on the measured capacitance-voltage curve. Even assuming that the Examiner is correct that Hung discloses the formation of an MS Schottky diode, the determination of the work function is by UV photoelectron spectroscopy, and not based on a measured capacitance-voltage curve. (See col. 4, lines 12-14 and lines 30-32). Hence, there is no suggestion whatsoever that it is appropriate to determine the work function of a metal in an MS Schottky diode based on a measured capacitance-voltage curve. The reference, in fact, teaches away from such a suggestion by employing UV photoelectron spectroscopy to measure the work function of a rare-earth metal silicide.

The combination of Webb and Hung cannot make obvious claims 1, 2 or 9 of the present invention since Webb fails to disclose anything regarding an MS Schottky diode and Hung fails to show or suggest the determination of a work function of a metal of an MS Schottky diode based on a measured capacitance-voltage curve. Further, no motivation has been provided, as is required to be set forth in an obviousness rejection, as to why one of ordinary skill in the art be led to combine the two references in the exact

Serial No.: 10/614,031

manner claimed in the present invention. The motivation must be based on facts. For this reasons, as well as those described above, the rejection of claims 1, 2 and 9 under 35 U.S.C. § 103(a) is legally and factually flawed and should be reconsidered and withdrawn. Such action is courteously solicited.

In light of the remarks above, this application should be considered in condition for allowance and the case passed to issue. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office on October 26, 2004.
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